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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,667	08/19/2003	Yoshihiro Satoh	03186-1/2002-239455	3481
21254	7590	11/03/2005	EXAMINER	
MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			NOVACEK, CHRISTY L	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/642,667	Applicant(s) SATO, YOSHIHIRO	
	Examiner Christy L. Novacek	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to the request for continued examination filed September 19, 2005 and the amendment filed August 18, 2005.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 18, 2005 has been entered.

Response to Amendment

The limitations added to claim 11 are sufficient to overcome the rejection of claims 11-23 and 26 under 35 U.S.C. 103(a) as being unpatentable over Saito (US 6,235,620, previously cited) in view of Araki (JP 2000-031277), the rejection of claims 24 and 25 under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Araki and the admitted prior art and the rejection of claim 29 under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Araki and Hsueh et al. (US 5,981,356).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention. Claim 23 recites the limitation of "said sidewall film". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-11 and 14-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Green et al. (US 5,773,341).

Regarding claim 1, Green discloses depositing a metallic conductive film (22) on an underlying insulating film (18), consecutively depositing first (24) and second (26) insulator films on the metallic conductive film, patterning the first and second insulator films to have substantially the same patterned area, etching the second insulator film selectively from the first insulator film to configure the second insulator layer to have a bottom with a width smaller than a width of the bottom of the first insulator film, patterning the metallic conductive film using the first and second insulator films as a mask, depositing a third insulator film (42) on the first and second insulator film and the underlying insulating film, etching-back the third insulator film to configure a side-wall film covering at least the patterned metallic conductive film and depositing a fourth insulator film (60b) to embed therein the side-wall film on the underlying insulating film (Fig. 11-13; col. 2, ln. 36-57; col. 4, ln. 37-58).

Regarding claims 2, 7 and 23, Green discloses that the sidewall film is a tapered mesa structure having a width larger at the bottom (Fig. 11).

Regarding claims 3 and 8, Green discloses, after depositing the fourth insulator film, etching the fourth insulator film to form therein a contact hole by using the side-wall film as an etch stopper and forming a contact plug in the contact hole (Fig. 12; col. 4, ln. 43-52; Fig. 13; col. 3, ln. 59-64).

Regarding claims 4 and 9, Green discloses that the first insulator film is a nitride film and the second insulator film is an oxide film (col. 2, ln. 51-53).

Regarding claims 5, 10 and 26, Green discloses forming a semiconductor memory device (col. 1, ln. 5-10).

Regarding claim 6, Green discloses depositing a metallic conductive film (22) on an underlying insulating film (18), consecutively depositing first (24) and second (26) insulator films on the metallic conductive film, patterning the first and second insulator films to have substantially the same patterned area, patterning the metallic conductive film using the first and second insulator films as a mask, etching the second insulator film selectively from the first insulator film to configure the second insulator layer to have a bottom with a width smaller than a width of the bottom of the first insulator film, depositing a third insulator film (42) on the first and second insulator film and the underlying insulating film, etching-back the third insulator film to configure a side-wall film covering at least the patterned metallic conductive film and depositing a fourth insulator film (60b) to embed therein the side-wall film on the underlying insulating film (Fig. 11-13; col. 2, ln. 36-57; col. 4, ln. 37-58).

Regarding claim 11, Green discloses depositing a metallic conductive film (22) on an underlying insulating film (18), consecutively depositing first (24) and second (26) insulator films on the metallic conductive film, patterning the first and second insulator films, etching the

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second insulator film to have a bottom with a width smaller than a width of the bottom of the first insulator film, and patterning the metallic conductive film (Fig. 11-13; col. 2, ln. 36-57; col. 4, ln. 37-58).

Regarding claim 14, Green discloses that the etching is performed after the patterning of the metallic conductive film (col. 4, ln. 37-52).

Regarding claim 15, Green discloses patterning the metallic conductive film using the first and second insulator films as an etching mask (col. 2, ln. 58-66).

Regarding claim 16, Green discloses depositing a third insulator film (42) on the first and second insulator films and the insulating film (Fig. 3; col. 3, ln. 10-12).

Regarding claim 17, Green discloses forming a sidewall film (43/44/45/46) by etching the third insulator film (Fig. 4; col. 3, ln. 13-22).

Regarding claim 18, Green discloses that the sidewall film covers at least the metallic conductive film (Fig. 4).

Regarding claim 19, Green discloses depositing a fourth insulator film (60b) on the sidewall film and underlying insulating film (Fig. 11; col. 4, ln. 37-42).

Regarding claim 20, Green discloses etching the fourth insulator film to form a contact hole (Fig. 12; col. 4, ln. 43-52).

Regarding claim 21, Green discloses that the sidewall film is used as an etch stopper during the etching of the fourth insulator film (Fig. 12; col. 4, ln. 43-52).

Regarding claim 22, Green discloses forming a contact plug in the contact hole (Fig. 13; col. 3, ln. 59-64).

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Regarding claim 24, Green discloses that the first insulator film is a nitride film (col. 2, ln. 51-52).

Regarding claim 25, Green discloses that the second insulator film is an oxide film (col. 2, ln. 52-53).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Green et al. (US 5,773,341).

Regarding claim 13, at the time of the invention, it would have been obvious to one of ordinary skill in the art to etch the second insulator layer either before or after the patterning of the metallic conductive film, as the order of these steps does not result in any functional difference in the product.

Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Green et al. (US 5,773,341) in view of Toyokawa et al. (US 6,576,509).

Regarding claims 27-29, Green does not disclose what type of etching is used to etch the second insulator film. Like Green, Toyokawa discloses forming transistors of a semiconductor memory device using layers of silicon oxide. Toyokawa teaches that the silicon oxide can be successfully etched using wet etching (col. 9, ln. 32-38). At the time of the invention, it would have been obvious to one of ordinary skill in the art to use wet etching to etch the second

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insulator layer of Green because Green discloses that the second insulator layer is made of silicon oxide and Toyokawa teaches that wet etching can successfully remove silicon oxide.

Response to Arguments

Applicant's arguments with respect to claims 11, 13-26 and 29 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christy L. Novacek whose telephone number is (571) 272-1839. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLN
October 30, 2005

